# Embedded C Programming

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## Introduction, IDE Installation, and Setting

It is a combination of MP/MC-based hardware and software with some mechanical parts to perform a specific task is called an embedded system

Desktop VS embedded system

Eg:- printers, mouse, and refrigerator (it do only the specific test)

What is the program?

* A program is a series of instructions that cause a computer or a microcontroller to perform a particular task.
* It also contains data and various memory addresses on which the instructions work to perform a specific task.

Programming languages in embedded systems

* C and C++
* Rust
* Assembly
* Java
* Python
* C, C++ is the most widely used if you take microcontrollers. If you take microprocessors the most widely used language is python.
* Raspberry pi,jestsen nano you use python.

Microcontrollers

* A microcontroller is a compact integrated circuit designed to govern a specific operation in an embedded system. A typical microcontroller includes a processor, memory, and input/output (I/O) peripherals on a single chip.

Microprocessors

* The microprocessor is the central unit of a computer system that performs arithmetic and logic operations, which generally include adding, subtracting, transferring numbers from one area to another, and comparing two numbers. It's often known simply as a processor, a central processing unit, or as a logic chip. It's essentially the engine or the brain of the computer that goes into motion when the computer is switched on. It's a programmable, multipurpose device that incorporates the functions of a CPU (central processing unit) on a single IC (integrated circuit).

Types of processors and controllers

1. microprocessors/microcontrollers(8data bit/16data bit/32databit)

Web site:-Digi-key

Manufacturers eg:-Dallas, Philips, Renesas, Freescale, texas, microchip

1. DSP(demand-side platform)
2. CPLD(complex programmable logic devices)/FPGA(field programmable gate arrays)
3. General purpose processors(GPU,AMD processor, 4,media GPU,graphic processing)
4. ASIC(application-specific integrated circuit)
5. soc(Security Operation Cente)

Eg:-snapdragon, raspberry pi

Microprocessor basic

The microprocessor must have external peripherals to interact with the outside.

Program memory, and data memory an external.

Microcontroller

Program memory, and data memory,timers,adc,can,parallel port internal.